

(19) World Intellectual Property  
Organization  
International Bureau



536 641

(43) International Publication Date  
24 June 2004 (24.06.2004)

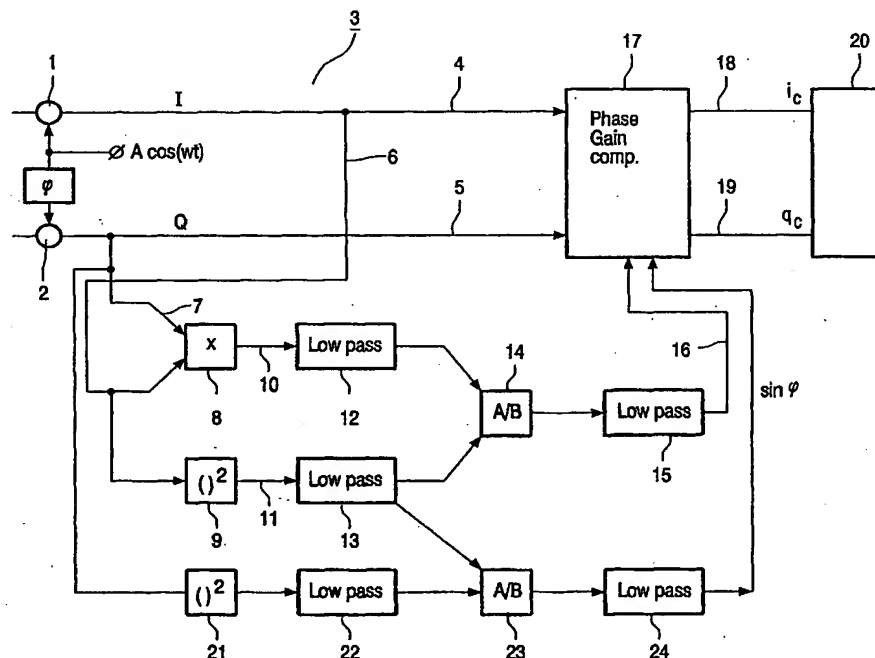
PCT

(10) International Publication Number  
**WO 2004/054194 A1**

- (51) International Patent Classification<sup>7</sup>: **H04L 27/00**
- (21) International Application Number:  
PCT/IB2003/005779
- (22) International Filing Date:  
28 November 2003 (28.11.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
02102707.3 9 December 2002 (09.12.2002) EP
- (71) Applicant (for DE only): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH [DE/DE]**; Stein-  
damm 94, 20099 Hamburg (DE).
- (71) Applicant (for all designated States except DE, US):  
**KONINKLIJKE PHILIPS ELECTRONICS N.V.**  
[NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven  
(NL).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **D'ALESSANDRO, Pierluigi [IT/DE]**; c/o Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
- (74) Agent: **MEYER, Michael**; Philips Intellectual Property & Standards GmbH, Weissshausstr. 2, 52066 Aachen (DE).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: **PHASE/GAIN IMBALANCE ESTIMATION OR COMPENSATION**



(57) Abstract: The present invention relates to a receiver for estimation or compensation of phase imbalance or gain imbalance utilizing a QPSK modulation and a modulation scheme based on a complex scrambling code. According to the present invention the phase imbalance or gain imbalance is estimated or compensated before synchronisation. Thus, the phase imbalance and gain imbalance will not be able to introduce losses in the further phases of the connection.

WO 2004/054194 A1